DOCUMENT RESUME

ED 144 043 CS 003 703

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TITLE Effects of Contextualized and Decontextualized Practice Conditions on Word Recognition. Technical Report No. 54.

INSTITUTION Bolt, Beranek and Newman, Inc., Cambridge, Mass.; Illinois Univ., Urbana. Center for the Study of Reading.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE Jul 77
CONTRACT 400-76-0116
GRANT NIE-G-74-0007
NOTE 37p.

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS Context Clues; Grade 1; *Learning Disabilities; *Oral Reading; Primary Education; Reading Instruction; *Reading Research; *Remedial Reading; *Teaching Techniques; *Word Recognition
IDENTIFIERS *Center for the Study of Reading (Illinois)

ABSTRACT

Six learning disabled boys served as subjects in a study designed to examine the effects of two instructional conditions on word recognition. In one instructional condition, students practiced reading exclusively in connected text (contextualized practice). In a second condition, reading in connected text was supplemented with drill on isolated word units (decontextualized practice). Students served as their own controls and received both treatments, with each treatment being repeated twice. Before and after each treatment condition, students were tested on recognition of isolated words and on oral reading in context. Results indicated that decontextualized practice produced significantly greater isolated word recognition and that performance following contextualized practice exceeded that of a no-instruction control. However, the instructional treatments did not differentially affect oral reading in context as measured by rate or accuracy. The implications of these findings are discussed in relation to the selection of reading objectives and reading measures by remedial reading teachers. (Author)

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Technical Report No. 54

EFFECTS OF CONTEXTUALIZED AND DECONTEXTUALIZED PRACTICE CONDITIONS ON WORD RECOGNITION

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July 1977

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The research reported herein was supported in part by the National Institute of Education under Contract No. MS-NIE-C-400-76-0116 and Grant No. HEW-NIE-G-74-0007. The authors wish to express appreciation to Laird Heal for his generous assistance in the data analysis and to Linda Jenkins and Darlene Pany for their cooperation and assistance in gathering data.

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Abstract

Six learning disabled boys served as subjects in a study designed to examine the effects of two instructional conditions on word recognition. In one instructional condition, students practiced reading exclusively in connected text (contextualized practice). In a second condition, reading in connected text was supplemented with drill on isolated word units (decontextualized practice). Students served as their own controls and received both treatments, with each treatment being repeated twice. Before and after each treatment condition, students were tested on recognition of isolated words and oral reading in context. Results indicated that decontextualized practice produced significantly greater isolated word recognition, and that performance following contextualized practice exceeded that of a no instruction control. However, the instructional treatments did not differentially affect oral reading in context as measured by rate or accuracy. The implications of these findings are discussed in relation to the selection of reading objectives and reading measures by remedial reading teachers.

Effects of Contextualized and Decontextualized Practice Conditions on Word Recognition

Reading instruction as typically provided in basal reading curricula is predominantly context bound. Although children may be briefly introduced to new vocabulary as isolated words, they receive most of their reading practice in the context of sentences, paragraphs, and stories. For some children, however, reading in context does not provide sufficient repetition of words to develop mastery. Faced with children whose word identification skills are inadequate, a teacher may attempt to resolve the problem in a variety of ways. One strategy is to advance the children to new material, hoping that reading will improve with increased experience. Another strategy is to require the children to reread the text until their performance improves. A third strategy is to locate or create supplementary text that contains the same words in new contexts. As an alternative to these contextual remedial strategies, the teacher may adopt a decontextualized strategy in which s/he extracts problem words from text and provides drill on these words as isolated units.

Remedial reading teachers who frequently elect a decontextualized approach employ such procedures as word drill, word bingo, lotto, or concentration to improve word recognition skills. Implicit in this approach is an expectation that drill on isolated words will ultimately improve reading accuracy and fluency in context.

There are differing opinions regarding the wisdom of decontextualized reading instruction. Those who favor isolated word instruction derive

support both from expert testimony and from research. Authorities in the field of reading such as Dolch (1942) and Otto, McMenemy, and Smith (1973) suggest that instant recognition of the Dolch Basic Sight Vocabulary is a necessary preprequisite for fluent accurate reading. On the empirical side, Shankweiler and Liberman (1972) report high (approximately .70) correlations between performance on isolated word lists and reading in context, while Perfetti and Hogoboam (1975) have found that the ability to recognize isolated words rapidly is a characteristic that distinguished good from poor comprehenders. Other investigators (Hartley, 1970; Samuels, 1970; Singer, Samuels, & Spiroff, 1973) have demonstrated that training words in isolation produces more rapid word acquisition than does contextual training (i.e., words in sentences or words accompanied by pictures). Thus, the empirical case for decontextualized instruction rests on the demonstrated correlation between reading words in isolation and in context, plus evidence that decontextualized training surpasses contextualized training in producing recognition of isolated words.

The strongest opposition to decontextualized instruction comes from those who adhere to a holistic view of the reading process (Goodman, 1965, 1972; Smith, 1973. According to Goodman (1972) early reading instruction should not focus on word learning since reading is a language process that cannot be broken down into sounds, letters, and words without qualitatively changing it. Instead, the emphasis in initial reading should be on teaching children to use a variety of strategies to help them construct meaning from text. According to this viewpoint, reading in connected text, with emphasis

on meaning, is the only acceptable vehicle of instruciton. To support the holistic model of reading, Goodman (1965) has presented data indicating that children recognized in context at least 50% of the words not recognized in isolation. These data led him to conclude that practicing words out of context is neither necessary nor desirable.

The potential contribution of decontextualized reading instruction to contextual reading performance remains an empirical question for which there is little data. Dahl (1976) reports the single investigation of the effects of decontextualized instruction on reading in context. She found no transfer of isolated word training to contextual reading. However, her failure to replicate a common finding (i.e., the superiority of isolated word practice in producing isolated word recognition; Hartley, 1970; Samuels, 1970; Singer, Samuels, & Spiroff, 1973) raises some doubts about the adequacy of her decontextualized practice condition. Since her decontextualized treatment did not affect isolated word recognition, her failure to observe treatment effects on context reading is not surprising. If transfer effects are to be studied, effects on isolated words first must be demonstrated.

The present study was designed to compare the effectiveness and efficiency of two commonly employed teaching strategies: reading in context alone (contextualized practice) and reading in context supplemented with isolated word practice (decontextualized practice). Reading performance was assessed both on isolated words and on connected discourse. In addition, the relative efficiency of the instructional procedures was examined by recording the number of sessions that children required to complete books read under each treatment condition.

Method

A repeated measures design was employed to evaluate the effect of two instructional procedures on four dependent variables. The effect of no instuction was also evaluated on one of the variables in a control condition. Students served as their own controls with each student exposed to one instructional procedure and then the other, followed by a replication of the sequence. Sequence was counterbalanced with one half of the students receiving an ABAB order, and the other half a BABA order. Pre- and post-tests were administered in each of the four instructional phases. Figure 1 illustrates the sequence of treatments and measurements.

Insert Figure 1 about here

Subjects and Setting

Subjects were six first grade, learning disabled boys, who had been referred to a special education resource room for remedial reading instruction. All instruction was conducted individually by specially trained, cross-age tutors who were supervised by the special education teacher. All testing was conducted by the first author. Two different elementary schools were used as training sites. Instruction occurred in the schools' special education resource rooms.

Materials

The instructional materials were the Sullivan Associates Programmed Reading Series (1963). Each student read four consecutive books in the

series. One child began in Book 2, four children began in Book 3, and one child began in Book 4. Each child had completed all preceding books in the series. New words introduced in each book were printed on standard 3 x 5 (.076 x .127 m) index cards. The number of new words per book varied from 52 in Book 2 to 82 in Book 6.

Dependent Measures

Four measures of reading performance were obtained: correct oral reading rate in context (apm), error rate (epm) in context, percent correct in context, and percent correct of words recognized in isolation. Isolated word reading and context reading each were measured for 3 days prior to entering a book and again upon completion of a book.

Reading measures in context. Reading selections, approximately 200 words in length, were extracted and photocopied from each book at four different points: one-quarter through the book, one-half through, three-quarters through, and at the end of the book. These pages were then cut up and reassembled into six test samples of approximately 125 words in length. This procedure ensured that the six samples were relatively equivalent, each containing material representative of the entire book.

Context reading was measured for 1 minute on each of the test samples. Errors were tallied during these performance samples and words read correctly were totalled after reading. Errors consisted of ommissions, substitutions, and additions. If a child paused for 5 seconds, the word was supplied by the examiner and recorded as an error. A percent correct statistic was also computed for each reading sample.

Reading measures in isolation. New words introduced in a book constituted the items for this measure. For 3 days preceding entry into a book and again for 3 days after completing a book, students were exposed to these words, printed on index cards, for a maximum of 3 seconds per word. Words correctly read by the child within the 3 second time limit were counted as correct; errors consisted of substitutions, misprounciations, or words not read within 3 seconds. No feedback was provided during these assessment sessions. The percent of words recognized correctly was computed for each child.

Instructional Procedures

All students regardless of their treatment condition began each tutoring sessions with a 2 minute practice of isolated letter sounds, concentrating on those sounds introduced in the book they were reading, as was the custom of the instructional program at their schools.

Contextualized practice condition. Students read orally to a cross-age tutor for 25 minutes. When the child failed to read a word correctly, the tutor directed him to "sound it out". If the child still did not correctly say the word, the tutor modeled the sounding out procedure and required the child to repeat the word. Reading during the next session began on material immediately following the completed pages.

Decontextualized practice condition. Students in this condition also received 25 minutes of daily instruction following the sound practice. However, this time was divided into 7 minutes of decontextualized practice and 18 minutes of contextualized (oral reading) practice. Each day, a timer

was set for 7 minutes. Isolated words were tested at the beginning of the session: each word was exposed for a maximum of 3 seconds. Words not recognized within this limit were practiced with the tutor until the 7 minutes had elapsed. The sounding out and modeling procedure used to correct errors was identical to that used in the contextualized practice condition. Verbal praise was given for correctly read words. Oral reading was then practiced for 18 minutes following the same procedure outlined for the contextualized condition.

No instruction. In addition to the two instructional conditions, a control condition was included to assess changes in isolated word recognition which occurred in the absence of direct instruction on those words. Words in the book following the third and fourth target book were employed. A pre-test on words from the fourth book was performed before the third book was read, and a post-test was administered after the third book was completed. Words from the fifth book were pre-tested and post-tested before and after instruction in the fourth book. Testing procedures were identical to those employed in the isolated word measures described above.

Reliability

Inter-observer reliability was obtained at least once per condition for each student. A second observer simultaneously recorded time, errors, and words correct. For the percent correct measures, reliability was computed by dividing the smaller percent correct correct by the larger percent correct. For the rate measures, a similar procedure was followed except that reliabilities were separately computed for cpm and epm. The mean agreement was

97% for cpm, 87% for emp, 98% for percent correct in context, and 98% for percent correct in isolation.

Results

Difference scores were employed in the analyses. That is, the median of the 3 days pre-test scores was subtracted from the median of the post-test scores for each treatment for each student on all dependent variables.

Word Recognition in Isolation

Two separate analyses of variance were computed for this dependent variable. First, order and replication effects were tested in a 2 (Order) x 2 (Replication) x 2 (Treatment) ANOVA. Only Treatment was significant, F (1,4) = 24.39, $p < .008$.

A one-way ANOVA, including the additional comparison of contextualized practice, decontextualized practice, and no instruction indicated that the three treatment conditions differed in their effectiveness in producing changes in isolated word recognition, F (2,8) = 43.61, $p < .001$. Tukey's HSD multiple comparison test (Kirk, 1968) revealed that the three treatments significantly differed from each other, with decontextualized practice the most effective and no instruction the least effective.

Examination of individual data (Figure 2) revealed that all but one student obtained higher word recognition scores with decontextualized practice. For that student, both instructional treatments were equally

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Insert Figure 2 about here

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effective, and superior to no instruction.

Word Recognition in Context

A 2 (Order) x 2 (replication) x 2 (Treatment) ANOVA was performed for each of the in-context measures. Neither Order nor Replication effects were observed on any measure. Moreover, Treatment effects were not observed for any context measures: percent words read correctly, F (1,4) = 1.29, N.S., correct words per minute, F (1,4) = 1.92, N.S., and errors per minute, F (1,4) < 1.0. Although students had improved significantly from pre- to post-testing, their improvements were not differentially affected by the two instructional conditions. Figures 3 and 4 illustrate the differential treatment effects for the four measures of reading.

Insert Figures 3 and 4 about here

An examination of individual pre- and post-test data suggests a possible treatment effect on cpm for some students, in that three of the six children displayed slightly greater gains in their oral reading rate during both exposures to decontextualized practice. However, no differential treatment effect was apparent for any students on accuracy measures. Figures 5 and 6

Insert Figures 5 and 6 about here

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show individual growth in cpm and accuracy in context as a function of the two instructional conditions.

Instructional Efficiency

Efficiency was defined as the number of sessions required to complete a 144 page instructional book. A t-test for dependent samples comparing the

mean number of sessions required to complete the two books in each condition revealed a significant effect favoring decontextualized practice, $t(5) = 3.55$, $p < .02$. The mean number of sessions required for decontextualized practice was 7.5, whereas the mean for contextualized practice was 9.5.

Discussion

In the present study, supplemental decontextualized practice was consistently more-effective than contextualized practice along in improving isolated word recognition. Samuels (1970) has argued that decontextualized instruction may force greater attention to the graphic features of the words. When context is available, the reader can rely on semantic and syntactic cues to anticipate and accurately produce words, without necessarily establishing an association to the graphic features of the words (Samuels & Jeffreys, 1966). The observed superiority of decontextualized instruction in this study could have been a function of changes in focal attention as suggested by Samuels.

An alternative explanation for these results involves differences in the number of exposures, that is, the greater number of repetitions of newly introduced words provided by the decontextualized training procedure. Although less effective than decontextualized practice, contextualized practice was clearly successful in improving recognition of isolated words (compared to no instruction). Treatment differences could reflect word repetition differences, suggesting that a more concentrated contextual practice (more repetitions) might augment isolated word recognition. Regardless of the explanation accepted for the current results, this study demonstrated that a single reading of contextual material was not itself

sufficient to produce high levels of accuracy on a measure of isolated word recognition. A training procedure stronger than once-over contextualized practice may be needed for any reading program whose goal includes isolated word recognition.

A distinctly different picture emerges when reading is measured in connected discourse. The apparent advantage of decontextualized practice for isolated word recognition was not observed when students read connected discourse. There are several plausible explanations for the failure to observe transfer from improved word reading in isolation to reading connected discourse. Semantic and syntactic cues in connected text may overprompt many words, contributing to recognition of "unmastered" words. Word recognition in context may not be a strong test of word knowledge since words recognized in the former circumstances are not necessarily recognized in the latter (Goodman, 1965). Nevertheless, all students in the present study significantly improved their context reading from pre- to post-tests, suggesting that context cues were not sufficient word recognition prompts at the time of pre-testing. Some word learning seems to have occurred in both the contextualized training conditions that would account for the improved reading accuracy during post-testing.

Another explanation for the failure of decontextualized instruction to transfer to context reading is related to the measurement procedure. In both instructional conditions, post-test accuracy, on the average, exceeded 90%; thus, an artificial ceiling may have partially masked treatment differences. Such an explanation is not supported by data from the cpm measure

which showed no ceiling effect, and on which treatments still did not differ. Nontheless, perhaps a more sensitive measure of reading connected discourse, such as accuracy on specified target words, might have distinguished the treatment conditions. In fact in a recent study, Jenkins and Larson (1977) report that when students were drilled on error words (words that the students were initially unable to recognize in context), their reading of these words in context was enhanced. HOwever, there is no evidence to indicate that practicing pre-selected words effects overall measures of reading performance such as oral reading rates, oral reading accuracy (e.g., informal reading inventories) or combinations of rate and accuracy (e.g. Gilmore Oral Reading Test, 1968).

The relative value of contextualized and decontextualized practice appears to vary according to the dependent measures selected for reading assessment. The measures employed in this study reflect the goals commonly held by reading teachers: increasing accuracy, improving fluency (rate), and increasing recognition of isolated words. While each of these measures has a certain amount of face validity, Goodman (1973) has cautioned against instruction that emphasizes accurate word recognition, arguing that such a procedure is likely to produce children who "bark at the print". Unfortunately, the optimal level of reading accuracy required for comprehension of connected discourse is not known. It is easy to imagine situations wherein a reader can construct an appropriate meaning from a passage, even though some words have been misread. On the other hand, it is equally easy to conceive of situations where misreading of words in a passage can greatly impair comprehension. Word recognition accuracy cannot be altogether discounted.

Turning now to reading rate, it seems fair to assume that an individual whose reading is slow and tedious will never be an enthusiastic recreational reader. Further, in many upper grade content areas, reading for information is only the first step in performing assigned activities. Students who read slowly may be prevented from completing subsequent activities within the time allotted. More important, however, are the theoretical hypotheses which have been proposed to account for the demonstrated correlation between reading rate and comprehension (Perfetti & Hogoboam, 1975). If poorly developed word recognition skills consume extraordinary levels of the higher order semantic processing that would normally be spent on comprehension, then automaticity (defined as the rapid, automatic recognition of words) may be a prerequisite to comprehension (LaBerge & Samuels, 1974; Perfetti & Hogoboam, 1975). Results of the present investigation, however, suggest that word drill may not be an especially promising intervention for increasing decoding speed in connected discourse.

Although reading in connected text is certainly the most important terminal behavior demanded of all readers, recognition of words in isolation is also a necessary skill. Road maps, restrooms, menus, libraries, and directories often do not furnish connected discourse cues, yet require accurate word recognition. Moreover, some widely used reading achievement tests rely exclusively on isolated word recognition to measure children's reading levels (Slosson Oral Reading Test, 1973; Wide Range Achievement Test, 1965). Further, demonstration of mastery of the isolated vocabulary is a prerequisite for advancement to the next level of some basal readers, (e.g.,

Bank Street Readers, 1966). Children who rely extensively on contextual cues to recognize words may be handicapped in the decontextualized situations just mentioned. A proficient reader is able to recognize and derive meaning from words whether they occur in the context of sentences or by themselves. Some form of decontextualized instruction may be helpful in improving children's performance on isolated word reading.

In light of the suggested goals, the data from this study offer two implications for reading instruction. First, the selection of instructional procedures depends on the goals of the reading program: the more directly related an instructional procedure is to a desired outcome, the more likely that outcome will be achieved. If performance in context is the primary goal, it may not be efficient to use a decontextualized procedure. In contrast, if recognition of words is isolation is a program goal, then a decontextualized procedure should be considered.

Second, these data highlight the necessity of appropriate assessment procedures. If an instructional strategy for influencing a terminal performance involves providing instruction on a presumed subskill of that performance, then regular assessments are needed for both performances. It would not do, for example, to gauge success in reading connected discourse, by measuring acquisition of isolated word reading, or vise versa. This is particularly true if the effects of one instructional procedure are idiosyncratic with respect to a particular student. With frequent and direct assessment, teachers can determine the effectiveness, or lack of effectiveness, of specific instructional procedures with specific children.

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Figure Captions

Figure 1. Experimental design indicating assignment of Students (S) to sequences of testing (pre - post) and Decontextualized (D) and Contextualized (C) treatments.

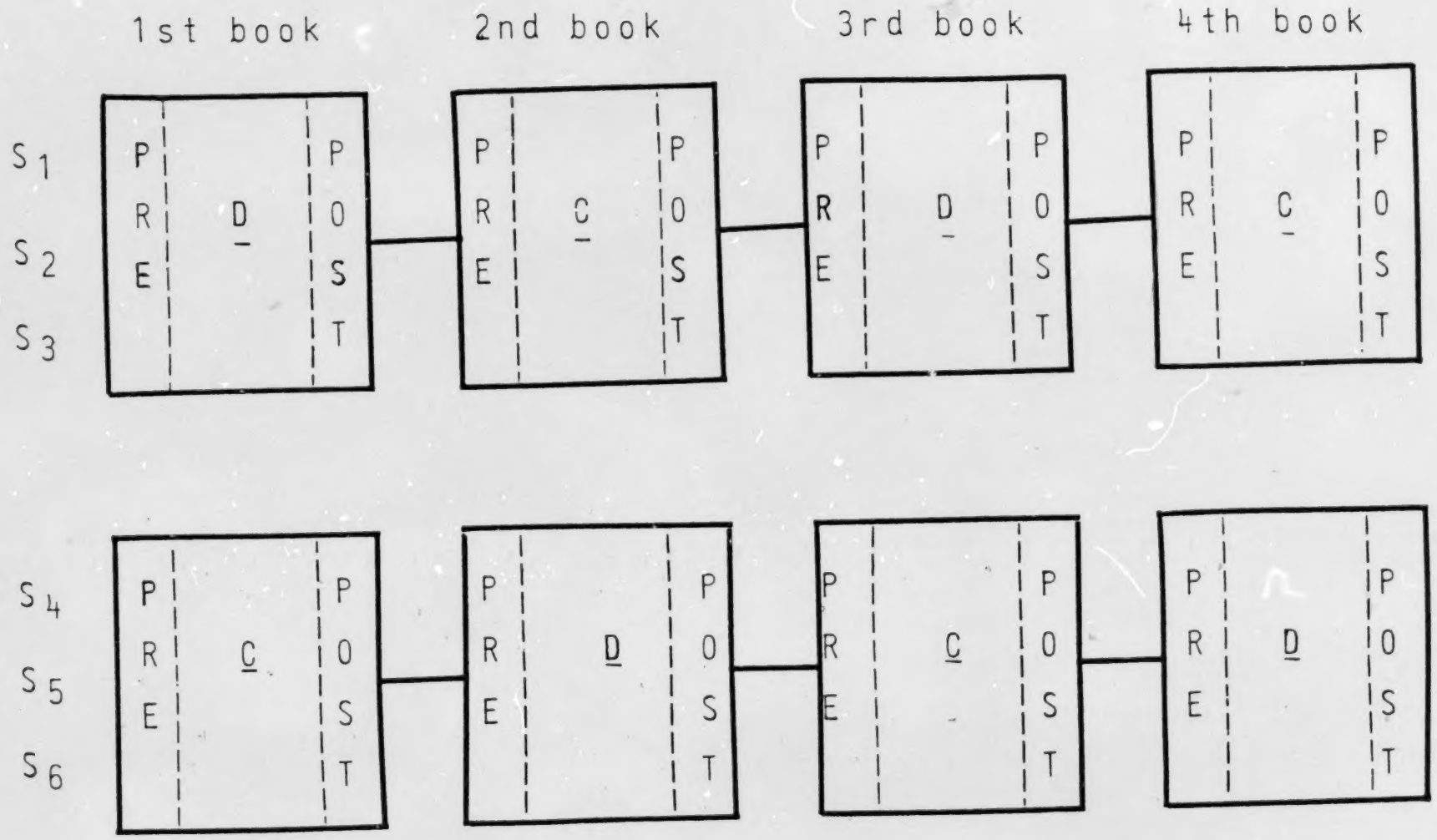
Figure 2. Individual growth in isolated word recognition as a function of Decontextualized practice (D), Contextualized practice (C), and No instruction (N).

Figure 3. Growth in word recognition accuracy in context and in isolation as a function of instructional condition.

Figure 4. Growth in correct words per minute and errors per minute as a function of instructional condition.

Figure 5. Individual growth in correct words per minute in context as a function of Decontextualized practice (D) and Contextualized practice (C).

Figure 6. Individual growth in accuracy in context as a function of Decontextualized practice (D) and Contextualized practice (C).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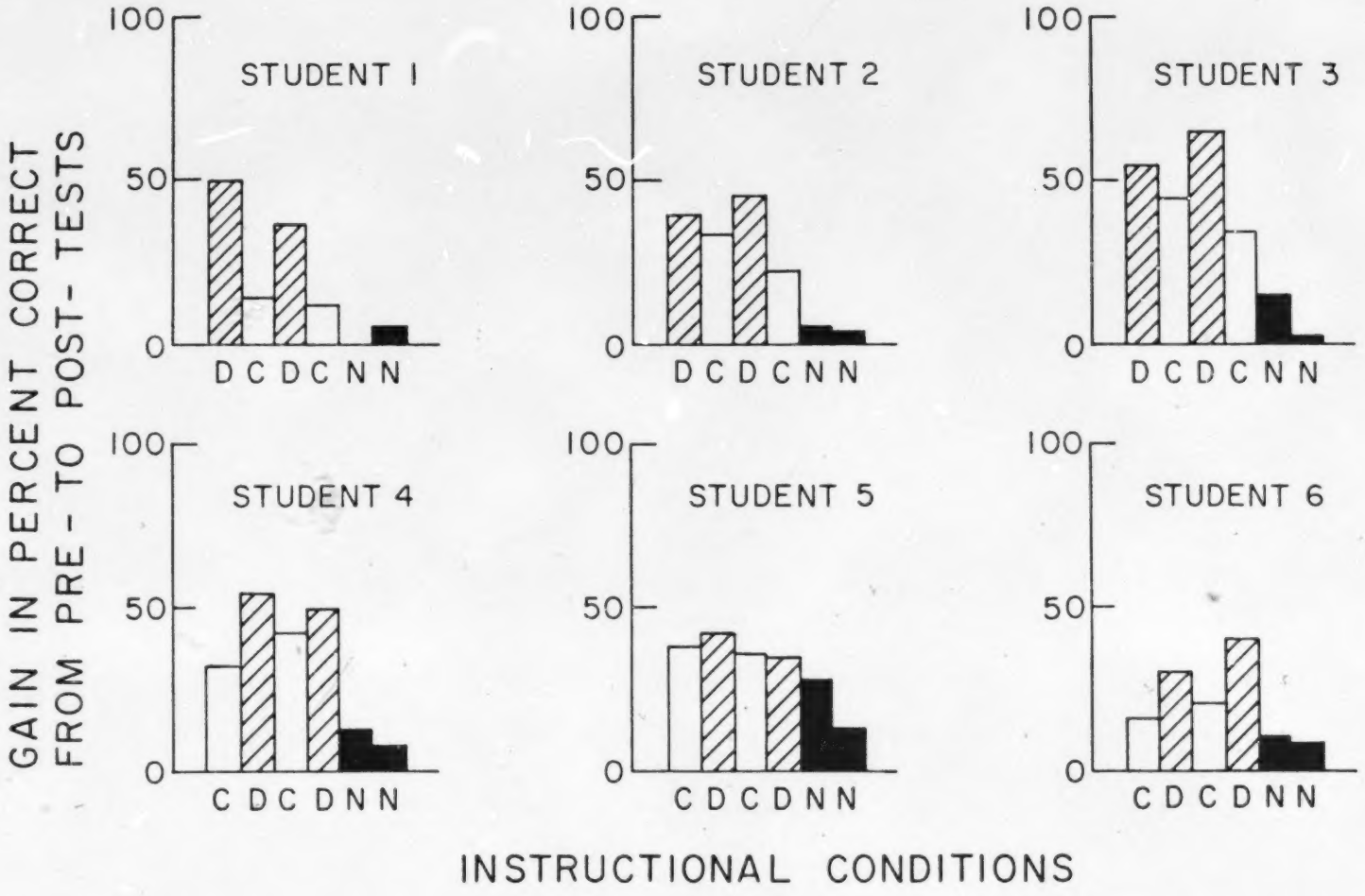
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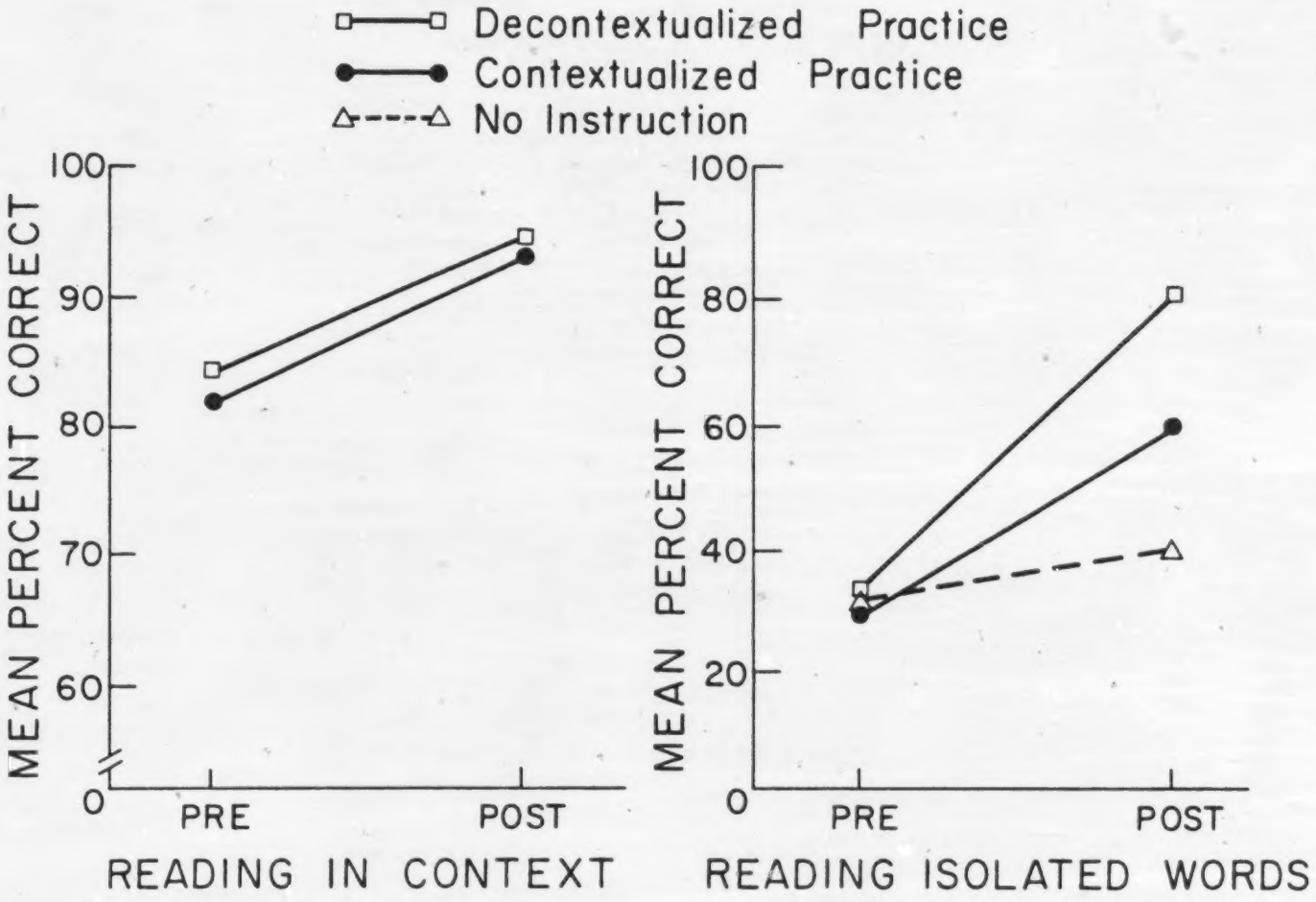
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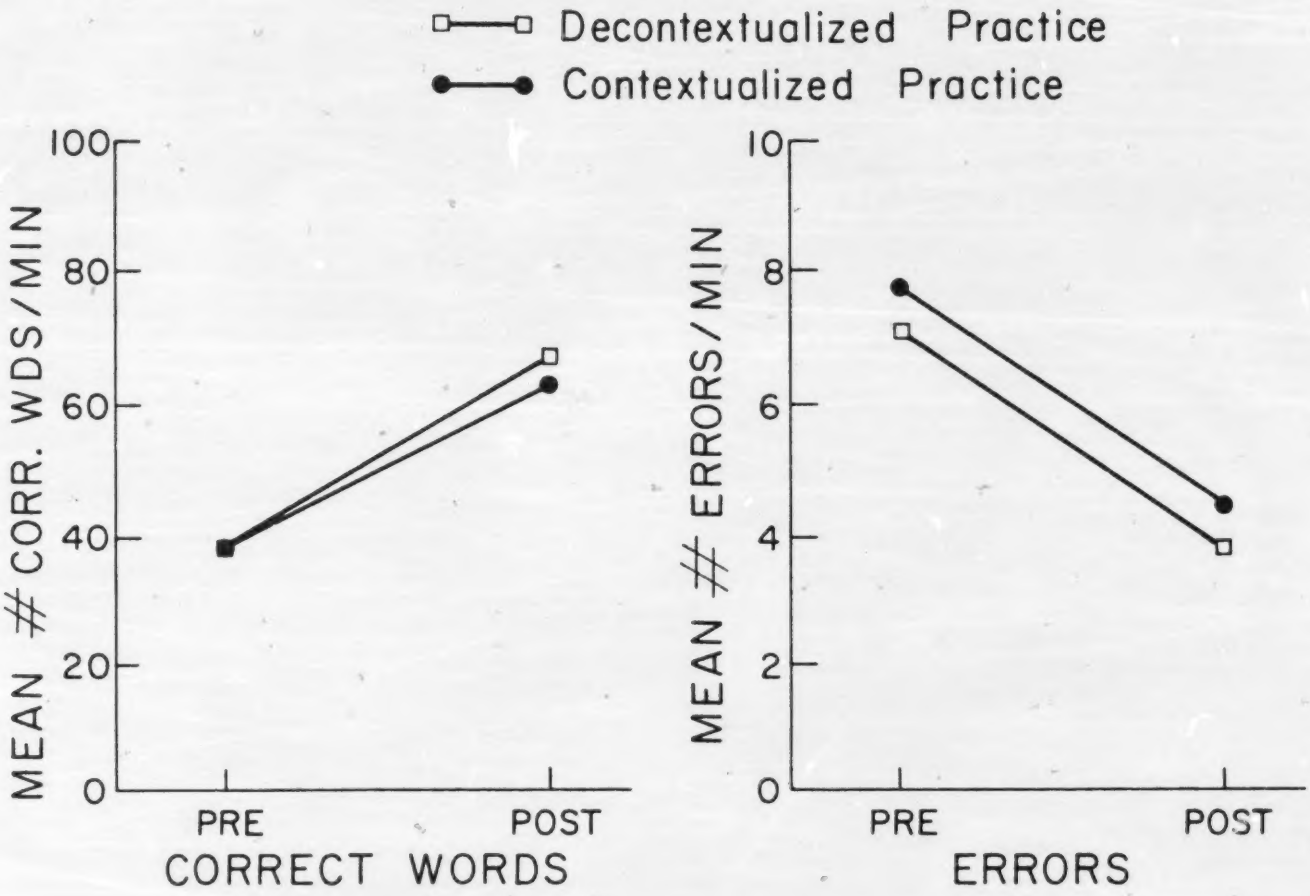
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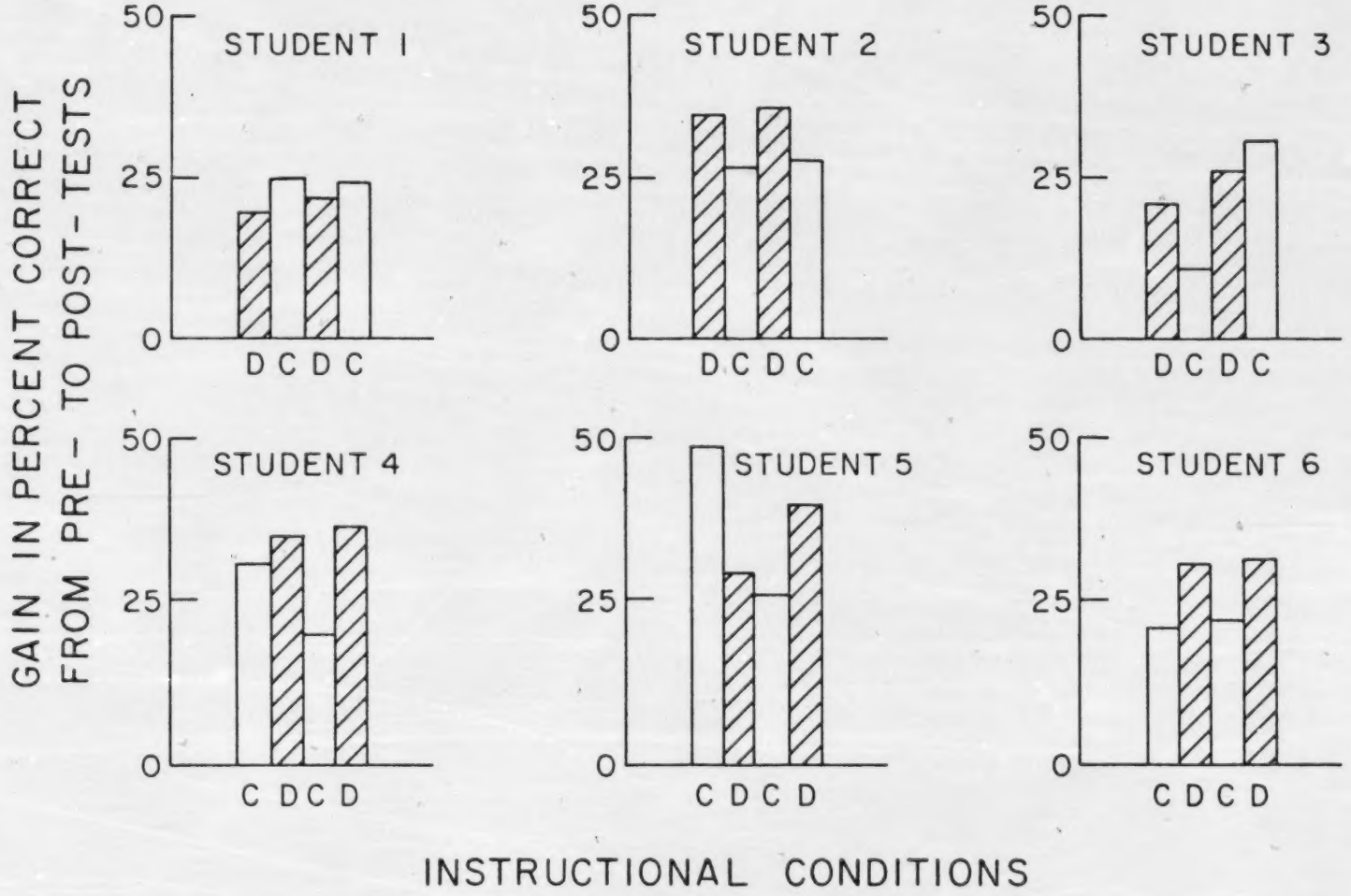
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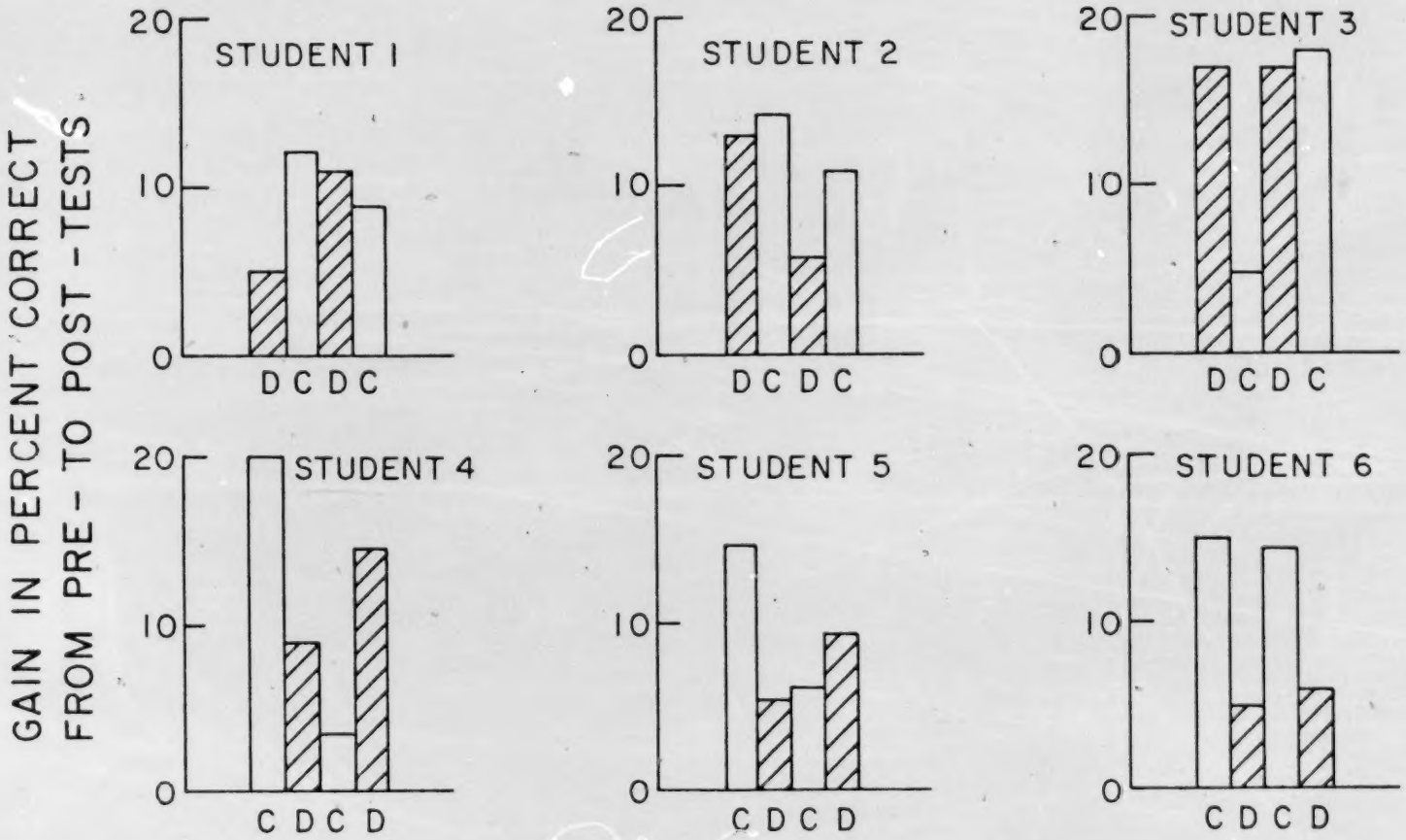
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